



MEDICAL BIOCHEMISTRY

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/10 (BIOCHEMISTRY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	EXPERIMENTAL AND APPLIED BIOLOGY
Curriculum	Scienze biomediche molecolari
Year of study	1°
Period	1st semester (01/10/2021 - 14/01/2022)
ECTS	9
Lesson hours	72 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	CANOBBIO ILARIA (titolare) - 9 ECTS
Prerequisites	To best appreciate the course content is necessary that the student know the biochemical reactions and structure of the principal biomolecules.
Learning outcomes	At the end of this course the student will be able to understand biochemical mechanisms of the principal hormones and signal transduction. the integrated knowledge aquired will then allow the student to correlate how dysfunctions in single organs and cells results in severe pathologies of the entire organism. Also, studying the biochemistry of the blood the student will be able to critically analyse the molecular mechanisms that drive systemic disorders.
Course contents	Part 1. Glucose homeostasis: metabolic response in diabetes. Principles and biochemical assessment of hormone action. The hypothalamo-pituitary system. Hormones from thyroid, adrenal cortex

and medulla, gonads. Eicosanoids. Major types of endocrine pathology. Structure and function of collagens, proteoglycans and glycosaminoglycans. The plasma proteins and their biomedical importance; free and esterified cholesterol; intestinal absorption of cholesterol; bile acids. Haemostasis; the conversion of fibrinogen to fibrin; thrombin; the role of platelets; the intrinsic and extrinsic pathway, anticoagulants; fibrinolysis. Hormone receptors. Intracellular and cell-surface receptors. G-protein coupled receptors and their effectors and second messengers: 1. cAMP/PKA. PLC: DAG, IP3 and calcium; 3. PI3K. Receptor tyrosine kinases: mechanism of activation and regulation. Signaling downstream Insulin. Receptor for cytokines, the JAK-STAT signaling pathway. Role of NO and cGMP/PKG in signaling. Interaction and regulation of signaling pathways.

Part 2. Calibration curve. Analytical error: precision, accuracy, sensitivity and specificity. Instrumentation and analytical test: spectrophotometric fluorimetric and luminometric techniques, SDS-PAGE and agarose electrophoresis, immunochemical methods (RIA, ELISA). Plasma proteins, lipoproteins and risk of atherosclerosis. Diagnostic enzymology.

Teaching methods

Frontal lectures and dedicated seminars. Practical exercitations are not provided.

Reccomended or required readings

lecture notes and teaching materials

Assessment methods

oral examination

Further information

oral examination

Sustainable development goals - Agenda 2030

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[The goals](#)